Approval of Harvesting near the Mara Meadows Ecological Reserve

Complaint Investigation 020435

FPB/IRC/96

May 2004

106-05004/

Table of Contents

The Investigation 1

Background 1

Issues Investigated 4

Conclusions 14

Commentary 15

Recommendations 16

The Investigation

On March 14, 2003, a Grindrod resident (the complainant) asked the Board to investigate the effect of road building and logging on the Mara Meadows ecological reserve. The complainant believes road building and logging in the basin of the meadows are adversely affecting water flowing to the ecological reserve. The complainant is particularly concerned about recent road building, logging and work around a stream by Larch Hill Development Corporation (the licensee) on a woodlot adjacent to the ecological reserve.

The complainant asked the Board to investigate whether the planning, forest practices and enforcement activities on the woodlot were adequate to protect water flowing into the ecological reserve and meet the requirements of the *Forest Practices Code of British Columbia Act* and its regulations (the Code). As remedies, the complainant asked the Board to recommend that the Ministry of Forests (MOF):

- suspend logging in the basin of the meadows until the sensitivity of the meadow to development is further assessed and stream classification is done; and
- develop water management policies to ensure that decision makers fully consider the importance of water resources and the concerns of other agencies.

The Board investigated the complaint issues for the area of the woodlot.

Background

Mara Meadows is one of 130 ecological reserves in British Columbia. British Columbia's ecological reserves are areas selected by the provincial government to preserve representative and special natural ecosystems, plant and animal species, features and phenomena. The key role of ecological reserves is to contribute to the maintenance of biological diversity and the protection of genetic materials.

The Mara Meadows ecological reserve is 15 kilometres east of Salmon Arm and covers 178 hectares. The ecological reserve has five red- or blue-listed[1] plants and the greatest known concentration of native orchids from a single location in BC.

---

[1] The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reports on the status of plants and animals in Canada. Red-listed plants are considered to be extirpated, endangered or threatened. Blue listed plants are considered vulnerable in British Columbia, but at a lower level of risk than red-listed species.

The meadows' rich plant community is believed to result from the quantity and unique chemistry of the water.[2] Water flows in the area of the meadow are intermittent, alternating between surface flows and subsurface seepage. The subsurface seepage moves through lime-rich materials, carrying high concentrations of calcium carbonate to the reserve. Surface and subsurface flows originate within a basin of approximately 1,800 hectares consisting of the ecological reserve and protected areas (approximately 260 hectares), part of the woodlot (approximately 360 hectares of private and Crown forest land), other private land (approximately 120 hectares) and other Crown forest land (approximately 1,050 hectares). Violet Creek is the largest stream entering the meadows.

The ecological reserve was established by an Order in Council in 1972. In 1975, an Order in Council reserved the water supply to the meadows on Violet Creek "from being taken, used, or acquired". In 1977, an Order in Council closed the ecological reserve to public access, except under permit, to protect the plants and wetland soils from disturbance. In 1991, an application by the District of Salmon Arm for a water license to divert water from Violet Creek was refused by the Deputy Controller for Water Rights. The District's appeal of that decision was rejected in May 1998.

In 1996, the former Salmon Arm Forest District commissioned an overview assessment of the possible hydrologic impacts to the ecological reserve from timber harvesting and road building proposed nearby. The assessment[3] outlined the potential impact of development on forest hydrology and recommended further study prior to development.

In December 1997, the district manager awarded the licensee a woodlot on the western side of the ecological reserve. The woodlot includes a segment of Violet Creek and has old roads from logging in the 1940's and earlier.

The licensee submitted a forest development plan proposing seven cutblocks totalling 26 hectares and seven kilometres of new road. The complainant reviewed the plan and expressed concerns about the potential impact on water resources and the ecological reserve. Ministry of Environment, Lands, and Parks (MELP), now known as the Ministry of Water, Land and Air Protection (MWLAP), staff reviewed the plan and recommended that the licensee provide further information prior to the district manager approving it. The district manager did not require the licensee to provide that information and approved the plan in December 1997, making it effective until November 30, 2002. The district manager later extended the term of the forest development plan until November 30, 2003.

In 1998, the licensee discovered water flowing down an old road, the result of a failed wooden culvert. The licensee redirected the water by digging a trench across the old road, digging a

---

[2] *Significance of Mara Meadows Ecological Reserve and the Importance of Maintaining the Meadow's Natural Water Regime*, H.L. Roemer, Nov. 1997

[3] *Re: Mara Meadows Operating Area*, Silvatech Consulting Ltd., July 16, 1996

70 metre long channel parallel to the road, and building a one metre high berm along one side of the channel. The channel and berm were intended to prevent further erosion of the road surface and restore the stream back to its original course, a tributary to Violet Creek. The channel is located approximately 200 metres from Violet Creek and 300 metres from the boundary of the ecological reserve.

The complainant discovered and reported the channel. MOF investigated and found that the licensee operated machinery near the stream bank without the authority of the district manager. The district manager determined that the licensee contravened the Code and ordered remediation actions intended to reduce the risk of the stream transporting sediments.

In January 2000, representatives from MELP and MOF discussed the potential impact on the ecological reserve from development of the woodlot. They agreed that an internal government study was needed to assemble all known information, to be led by hydrologists from those agencies.

In December 2001, the complainant expressed concerns to the district manager about the impact of logging and road building on the watershed. Staff met with the complainant on several occasions to discuss concerns.

In January 2001, the Okanagan Shushwap Land and Resource Management Plan was approved by government, providing direction for the management of Crown land within the plan area. The LRMP established protected areas on the eastern boundary of the ecological reserve and along most of Violet Creek above the ecological reserve. It does not specify any management provisions for those protected areas, the ecological reserve or nearby areas.

In April 2003, a MOF hydrologist reported that the extent to which new and old roads have modified the natural surface and subsurface water flow is unknown.[4] The hydrologist recommended further study to improve understanding of the wetland, surface hydrology, groundwater, geochemistry and climatic processes. The hydrologist also recommended developing a management plan for the entire Mara Meadows watershed. The hydrologist advised that, until the hydrology of the watershed is better understood, any upland development should proceed in careful consideration of the meadows downslope.

In January 2003, the licensee submitted an amendment proposing six new cutblocks. In June 2003, the district manager approved four of the cutblocks totalling 34 hectares. He did not approve two of the proposed cutblocks that would require completing the construction of 600 metres of new road, approved in the 1997 forest development plan. The licensee volunteered to defer building that section of previously approved road.

---

[4] *Re: Mara Meadows and Surrounding Area*, R. Winkler, April 23, 2003.

Issues Investigated

Surface and subsurface water entering the meadows partly originates outside of reserved and protected areas, in areas available for forestry and other development. Several Acts set out requirements that reduce the risk of development affecting the water flowing to the meadows. The *Water Act* restricts the use or diversion of water from streams, but does not dictate how forest practices are done. The *Fisheries Act* requires maintaining fish habitat, which can have implications for forest practices. The Code, since replaced by the *Forest and Range Practices Act*, set minimum requirements for planning and forest practices, and provided statutory decision makers with authority to enforce those requirements. All three Acts applied to activities on the area of the woodlot, regulating distinct aspects of water management.

The Board has authority to investigate only Code-related issues such as logging and road building; planning and understanding of drainage; and enforcement of the Code. The Board investigated the following issues:

- Did logging and road building meet the requirements of the Code?
- Were logging and road building practices adequate to protect water flowing into the ecological reserve?
- Did planning meet the minimum requirements of the Code?
- Was approval of the plans reasonable?
- Did the ministry adequately enforce the Code?

Logging and Road Building

Did logging and road building meet the requirements of the Code?

The complainant is concerned that the licensee's unauthorized stream work might indicate that forest practices elsewhere on the woodlot were non-compliant with the Code.

Code requirements were mostly intended to protect water for fish and human use, rather than to address water quality for special features such as an ecological reserve. For example, there was no specific requirement for a licensee to manage subsurface flows to maintain water chemistry. While the Code's specific forest practices requirements were limited, it did provide some protection for water resources by requiring a licensee to:

- not operate ground-based machinery within five metres of a streambank, except under conditions specified by the Code;
- leave treed buffers along some streams;
- meet soil disturbance limits and rehabilitating excavated trails; and
- maintain surface drainage patterns and protect water quality.

Board staff assessed compliance with those requirements by examining all roads on the woodlot and seven of the eight cutblocks. Board staff found that the cutblocks of the woodlot did not contain any streams requiring buffers or machine-free zones. Draws and depressions present on some cutblocks were not "streams" under the Code, but were "non-classified drainages". The Code did not require the licensee to leave trees or take other precautions around non-classified drainages.

Staff found that the licensee's road logging and road building practices complied with requirements for soil disturbance limits, rehabilitating excavated trails, and maintaining surface drainage patterns, except for a small section of inadequate road maintenance. The licensee did not maintain a 400 metre long section of road surface as required by section 42(1)(j) of the previous *Woodlot License Forest Management Regulation.* Minor erosion has occurred along that section of road. Eroded material was deposited near the road and likely did not affect the quality of water flowing to the reserve. Therefore, the Board considers the non-compliance to be not significant.

Board staff also found that two culverts, located in a Forest Service Road running through the woodlot, were not functioning. None of the public or private organizations covered by the Board's investigation were responsible for maintaining those culverts. The culverts were not at stream crossings or defined channels. Their condition likely did not have a significant affect on the quality and quantity of water flowing to the reserve.

With the exception of channelling the creek, and a small section of inadequate road maintenance, the Board finds that the licensee met the Code's logging and road building requirements related to managing water resources.

Were logging and road building practices adequate to protect water flowing into the ecological reserve?

The complainant believes that forest practices are increasing sediment delivery and altering the chemistry of the water entering the ecological reserve. The complainant's view is that the licensee should be applying a higher standard of management, such as protecting all draws or depressions during logging through buffers or machine-free zones. The excavated channel, harvesting and road cuts are all of concern to the complainant.

The excavated channel

The complainant believes that the excavated channel is straighter and deeper than the original channel, resulting in faster water flows that increase the potential for sediment delivery and decrease infiltration of stream water into the ground. Also, the complainant observed erosion where the stream drops approximately two feet into the start of the excavated channel.

A WLAP hydrologist found it unlikely that the excavated channel follows the alignment of the original channel, and that the capacity of the excavated channel likely exceeds extreme

discharge requirements. He found that a lateral berm near the edge of the road may have been adequate to prevent flow along the road and would have reduced environmental impacts.

The Board hydrologist considered whether the channel was likely to affect water quality flowing to the reserve. The Board hydrologist noted that streams usually collect subsurface water, rather than contribute to it. The hydrologist found no evidence that the stream loses flow and contributes to subsurface flows. Therefore, the excavated channel likely has no bearing on subsurface flows or the chemistry of the water flowing to the ecological reserve.

The Board hydrologist found that the erosion at the start of the excavated channel was similar to that occurring upstream, where the natural channel has small waterfalls and highly erodible sands. In the vicinity of the excavated channel, the hydrologist found that the stream has changed course over time, making it difficult to establish the location of the natural stream. The excavated channel likely follows the natural stream channel for part of its length, but is straighter and deeper than the natural channel. Consequently stream velocity and vertical erosion may be higher than the natural channel. However, lateral erosion in the excavated channel will be considerably less than in the original channel. The hydrologist's opinion is that, on balance, the excavated channel is more stable than the original channel and is expected to have no detectable affect on water flow or sediment yield to Violet Creek or Mara Meadows.

Harvesting and road cuts

Harvesting and road building can potentially affect forest hydrology by changing runoff peaks and timing; affecting groundwater infiltration rates; diverting and concentrating surface runoff; increasing levels of erosion and sedimentation, and intercepting subsurface flows and concentrating them at the surface.[5] To minimize the risk of forest development adversely affecting the water flowing to the ecological reserve, the 1996 overview assessment recommended:

- keeping openings small and closely monitoring the total cut areas for the basin to minimize the possibility of increasing peak flows;
- providing frequent cross drainage along roads to prevent the concentration of surface flows;
- incorporating existing or old road alignments into future access plans to minimize impacts to undisturbed soils, where possible; and
- avoiding crossing established watercourses to prevent direct inputs of sediment.

The Board interprets that the recommendations suggest using a management approach that exceeds standard Code practices. The recommendation to monitor total cut would be the responsibility of government, while the other practices-specific recommendations are the

---

[5] Silvatech Consulting Ltd. July 16, 1996.

responsibility of forest practitioners. The licensee used standard harvesting and road building practices and did not use any extraordinary measures or give special consideration to the recommendations.

The Board found no records or ancillary evidence on whether the licensee's management approach has affected the ecological reserve. Assessing the impact of road cuts and harvesting would require instrumentation and comparisons to unroaded and pre-harvest baseline information. The results would require careful interpretation, since any observed changes may be attributable to factors other than the forest practices on the woodlot. In any case, no baseline information exists. Therefore, the Board could not determine whether harvesting and road building have adversely affected the quality of water flowing into the ecological reserve.

In summary, the licensee used standard Code management practices for harvesting and road building. The Board was unable to assess whether that approach was adequate to protect water flowing into the ecological reserve.

Planning and Understanding of Drainage

The complainant believes that inadequate planning and understanding of drainage are resulting in damage to the reserve. The complainant's view is that the district manager did not adequately consider the risk to the ecological reserve when he approved the plan, and that further assessments should have been done first, as recommended by MELP staff and the 1996 overview assessment.

Central to the complaint is whether the information available was adequate to allow for sound decision-making. Additional assessments and studies can provide information needed to assess risk and support decision-making. For example, a watershed assessment procedure can help forest managers understand the type and extent of current water-related problems that exist in a watershed. The results can be used to assess the appropriateness of development proposals and develop recommendations for forest practices to mitigate potential impacts. Recommendations can then be incorporated into operational plans for implementation on the ground. The drawback is that additional assessments can be expensive, time consuming, and inconclusive in their results.

The Code addressed adequacy of information for the development and review of a forest development plan by i) providing minimum information requirements, and ii) providing the statutory decision-maker with discretion for assessing whether information is sufficient to evaluate the risk to forest resources, and whether that risk is acceptable. Accordingly, the Board investigated the following issues for the 1997 forest development plan and 2003 amendment:

i) Did the planning meet the minimum requirements of the Code?

ii) Was approval of the forest development plan reasonable?

Did planning meet the minimum requirements of the Code?

The complainant contends that the licensee should have: considered alternatives to clearcutting; undertaken further assessments such as a watershed assessment procedure; identified and planned for small streams and gulleys; and identified and addressed the ecological reserve in its forest development plan.

There was no requirement for a licensee to consider alternatives to clearcutting during planning. The Board considered whether the licensee met Code requirements to:

1) complete a watershed assessment procedure
2) classify streams
3) identify and address protected areas and forest resources

A district manager could only approve a plan if it met all minimum requirements, including those listed above.

Watershed assessment procedure

The Code required a watershed assessment procedure for community watersheds, but provided the district manager with discretion whether to require a watershed assessment for other areas (previously section 32 of the *Operational Planning Regulation*, or OPR). The woodlot is not in a community watershed and the district manager did not require a watershed assessment. The licensee was therefore not required to prepare a watershed assessment procedure prior to submitting the 1997 forest development plan.

The 2003 amendment was subject to the *Woodlot License Forest Management Regulation* (WLFMR), rather than the OPR. The WLFMR did not require the licensee to prepare a watershed assessment procedure. It provided the district manager with discretion to require the licensee to provide the information needed to complete a watershed assessment procedure. The district manager did not require the licensee to provide any such information.

Stream classification

The Code required a licensee proposing to carry out timber harvesting or road construction in an area under a forest development plan to determine the riparian class for each stream (previously section 28 of the OPR). The licensee interpreted, based on discussions with MOF staff, that it was not required to classify streams in its 1997 forest development plan. Instead, it provided default stream classifications in the forest development plan and committed to completing a stream inventory over the term of the plan. The district manager accepted the licensee's approach to stream classification, approving the forest development plan but requiring the licensee to complete a stream inventory over the term of the plan. The licensee did field work to classify streams in 1998 and later had a hydrologist complete a formal stream inventory in 2001.

That stream inventory indicated that cutblocks and logging did not involve any streams, with one exception. The stream inventory determined that the stream channelled by the licensee,

assumed to be a non-classified drainage in the forest development plan, was an S6 stream. The licensee recognized the stream as an S6 at the time of excavation. The licensee's decision to not classify streams until after submission of the 1997 forest development plan was contrary to the Code, but was in accordance with the district manager's approval and did not affect the management of streams, and was therefore considered by the Board not to be significant. The licensee included the stream classifications in the 2003 amendment to the forest development plan, although there was no specific requirement for it to do so under the WFLMR.

Identifying and addressing protected areas and forest resources

The Code required a licensee to identify and describe, for the area under the forest development plan, the known locations of protected areas or sensitive areas (previously section 15 of the OPR.) The Mara Meadows ecological reserve, established through an Order in Council, is a protected area. However, the licensee interpreted, based on discussions with MOF staff, that the "area under the plan" did not include the ecological reserve. The Board interprets that a licensee had to ensure that the plan addressed an area sufficient in size to include all areas affected by the timber harvesting and road construction under the plan. Since the ecological reserve could be affected by activities proposed on the woodlot, the Board's view is that the area of the plan includes or should have included the ecological reserve. The licensee did not identify the location of the ecological reserve in its 1997 forest development plan, contrary to the Code requirem ent. In the Board's view, that omission could have hindered the public from commenting meaningfully on the plan. The licensee included the location of the reserve in the 2003 amendment to the forest development plan although, under the WLFMR, it was not required to do so.

The licensee was also required to include measures to protect forest resources affected by the proposed development (previously section 10(c)(ii)) of the Act). Ecological reserves are protected areas, which are forest resources. The 1997 forest development plan did not include any specific measures to protect the ecological reserve. At the time it was approved, therefore, the 1997 forest development plan would not have met the requirement to specify measures to protect the ecological reserve. However, a December 2002 Code amendment deemed all forest development plans existing at that time to be in compliance with section 10(c)(ii).

The 2003 amendment described actions to protect water resources, stating Code requirements for riparian management will be met, but did not mention the ecological reserve or describe specific actions for protecting it. However, by this time the legislation did not require forest development plans for woodlots to include measures to protect forest resources.

In summary, the licensee complied with the Code's minimum planning requirements related to the ecological reserve, with one exception. The exception is that the licensee failed to identify the location of the ecological reserve in its 1997 forest development plan, potentially hindering the public in commenting on proposed development. Therefore, the statutory decision maker's approval of the 1997 forest development was contrary to the Code.

Was approval of the plans reasonable?

The Code, in addition to prohibiting approval of a plan not prepared in accordance with the Code's planning and other requirements, provided a separate and distinct test that a forest development plan or amendment had to meet before a district manager approved it. A district manger had to be satisfied that the operational plan would "adequately manage and conserve" forest resources in the area of the plan (section 41(1)(b) of the Act).

The Board views section 41(1)(b) as a safety net for any forest resource not explicitly addressed by the licensee in their submission of a forest development plan, but for which the district manager has information. The Board's view is that a district manager had to weigh all of the relevant information to determine the relevance and importance of each applicable forest resource, and then consider risk in making the final approval decision. The more important a resource and serious the potential risk to it, the greater the caution and deliberation necessary before there can be any "satisfaction" regarding the adequacy of management and conservation. It follows that the district manager's reasoning should be substantiated in writing, especially where there is potential negative effect on an important resource, to ensure transparency to anyone interested.

Applying the Board's interpretation of section 41(1)(b), the Board assessed whether the district manager's approval of the 1997 forest development plan and the 2003 amendment was reasonable.

The 1997 forest development plan

The statutory decision maker who approved the 1997 forest development is deceased. The Board's assessment of the approval is based on a review of supporting documentation and interviews with other staff. The statutory decision maker's determination listed the information he considered in his decision, including some information relevant to the management of the ecological reserve:

- the 1997 field trip to the watershed by MELP and MOF staff;
- the draft forest development plan, and the management and working plan; and
- comments by the MELP forest ecosystem specialist.

The 1997 field trip was specific to the eastern side of the meadow and did not result in any recommendations for forest management. In the Board's view, the field trip was likely of limited value to assess the risk to the ecological reserve from the proposed woodlot development.

The draft forest development plan and working plan described the licensee's general approach to managing roads and streams. Those documents state that road construction would be kept to a minimum and that it would adhere to the Code regarding riparian buffers and road construction, maintenance and deactivation. Neither document mentions the ecological reserve or proposes any specific actions to address it. Since the Code's requirements are not designed to address unique situations such as the chemistry of water flowing to the reserve, those plans

alone would not have allowed the district manager to fully assess the potential impact of proposed development on the ecological reserve.

The forest ecosystem specialist indicated that the risk associated with the proposed development was uncertain, stating he could not evaluate the proposed forest development plan and recommended delaying approval for the plan until the licensee:

- identified and delineated the portion of the woodlot that drains into the meadows
- delineated the entire sub drainages for the creeks that drain through the woodlot and into meadows
- provided, at a minimum, calculations for Equivalent Clearcut Area (a measure of logging disturbance in a watershed) and road density for the Mara Meadows sub-drainages

MOF did not undertake that recommended work. MOF staff provided a rationale responding to those comments, stating the impact of proposed development on forest hydrology is mitigated by Violet Creek going underground before it enters the ecological reserve. The Board interprets that the comment speaks only to the issue of sediment transportation. MOF's rationale does not address the issue of road cuts potentially intercepting subsurface flows and altering water chemistry. In the Board's view, the rationale did not provide clear and adequate assessment of risk or address MELP's concerns about the uncertainty of the risk to the ecological reserve.

While not referenced in the approval rationale, MOF had also commissioned the 1996 overview assessment. It indicated that harvesting and road building could affect forest hydrology, and recommended adhering to the Code and undertaking further study to determine the optimum water levels in the meadows prior to development in the watershed. It also recommended minimizing the possibility of increasing peak flows by keeping stand openings small and closely monitoring total cut areas for the watershed.

In the Board's view, the overview assessment, field trip and staff rationale suggest that MOF understood the potential sensitivity of the ecological reserve to forest development. However, the statutory decision maker did not provide an analysis of risk, or otherwise mention the ecological reserve. He provided no explanation of how available information supported his determination.

Importance of the ecological reserve is demonstrated by the orders that created the ecological reserve, closed it to public use, and prevented diversion of water flowing into the meadows. In the Board's view, the high public value of the reserve, combined with the uncertainty about the impact of the proposed development, warranted a corresponding amount of caution, deliberation and transparency in the decision to approve the plan. Given the absence of a transparent rationale demonstrating how the statutory decision maker concluded that the forest development plan would adequately manage and conserve forest resources, the statutory decision maker's approval of the plan was not reasonable.

The 2003 amendment

The district manager's approval of the amendment described both the ecological reserve as an important area with unique plants and values, and the need for the woodlot licensee to have some approved volume to harvest. The district manager stated that he relied on the advice of the MOF hydrologist, provided in her 2003 report and in direct discussions. Based on the hydrologist's advice, his opinion was that roads and large cutblocks could impact water flows to the ecological reserve. However, he found that:

- the proposed cutblocks were relatively small;
- the proposed harvest area was low relative to the area harvested to date in the woodlot area;
- four of the proposed cutblocks required no new road construction; and
- harvesting was not expected to result in significant ground disturbance.

He concluded that approving the four cutblocks that did not require additional road would have minimal additional impact on the hydrology of the ecological reserve. He stated that the approval was a conservative yet balanced approach until such time as MOF is able to fully determine the actions that would be appropriate.

The district manager's rationale provides no supporting documentation to demonstrate that the amount of harvest and its impact was low. In the Board's view, the district manager's rationale was incomplete and should have included some evidence to support that position, given the importance of the ecological reserve. However, he recognized the importance of the reserve relative to other resource values (i.e. timber values). The district manager realized that roads could affect hydrology of the reserve and did not approve cutblocks that would require new road construction. The district manager considered the risk that proposed development posed, and found that risk to be low based upon recent information and advice from the hydrologist. On balance, the Board believes that it was reasonable for the district manager to decide that the amendment would adequately manage and conserve forest resources and approve it.

Enforcement of the Code

Did the ministry adequately enforce the Code?

The complainant believes that the ministry's enforcement actions were inadequate regarding the licensee's channelling of the creek to redirect water flowing down the old road. Given the potential consequences of the channel on the ecological reserve, the complaint believes that the district manager should have issued a stop work order, levied a penalty and required the licensee to restore the creek to its natural bed.

The purpose of enforcement is to promote compliance with the Code. Enforcement activities generally begin with monitoring and inspections. These should be done at a frequency that is appropriate for the risk to forest resources. If problems are discovered, the ministry has a number of tools available to promote compliance. These tools escalate in severity and include written instructions, remediation orders, stop-work orders, administrative penalties, prosecution and licence cancellation. The Board therefore addressed the complaint issues by considering whether an appropriate range of enforcement actions were used to encourage compliance.

The district manager determined that the licensee operated machinery within five metres of a stream bank without permission, contravening section 24(1) of the *Timber Harvesting Practices Regulation*. He had discretion to levy a penalty of up to $10,000 for that contravention, but decided not to levy a penalty. In making that decision, the district manager considered extenuating circumstances identified by investigation staff, including that:

- the licensee dug the channel to prevent erosion of the road surface;
- the licensee had inspected the area with the MOF woodlot forester prior to starting the work, and thought he had the woodlot forester's approval to start the work;
- work was done when there was no water in the stream;
- the channel did not have any siltation and the berm was stable; and
- the licensee was very cooperative during the investigation.

In the Board's view, those considerations are consistent with those set out in section 117 of the Code for a district manager when deciding on a penalty:

- the gravity and magnitude of the contravention;
- whether the violation was repeated, continuous, or deliberate;
- the licensee's cooperativeness and efforts to correct the contravention.

A district manager could order a licensee to do work to remedy a Code contravention by requiring a licensee to repair any damage caused by the contravention to the land on which the forest practice was carried out (section 118 of the Act). In this case, the district manager ordered

some remediation, including that the licensee periodically monitor the berm and spring channel after each freshet or significant rain event to ensure that channel integrity is being maintained; reslope the banks of the cross ditch; and place waterbars on the road on the north side of the stream. The remediation order was consistent with the recommendations of the MELP hydrologist, who reviewed the excavated channel and trench. The Board hydrologist found that the excavated channel is more stable than the original channel and is expected to have no detectable affect on water flow or sediment yield to Violet Creek or Mara Meadows. MOF assessed remediation actions and was satisfied that the recommendations had been implemented. Given the opinions of the MELP and Board hydrologists, the Board's view is that remediation was adequate to repair drainage.

The district manager also had discretion to issue a stop work order for the channel work under section 123 of the Act. The district manager considered a request by the complainant to issue a stop work order, but did not issue one because he found that current operations on the woodlot complied with the Code. The Board's view is that a stop work order is best suited to ongoing contraventions, which did not apply here.

In summary, the MOF used an escalating range of enforcement actions to promote compliance with the Code, including investigating, determining that the licensee contravened the Code's requirement regarding operating near streams, and requiring remediation in accordance with the recommendations of a MELP hydrologist. The decision not to levy a penalty or issue a stop work order was appropriate for the circumstances. The excavated channel is expected to have no detectable affect on water flow or sediment yield to Violet Creek or Mara Meadows. For these reasons, MOF's enforcement of the Code was adequate in the Board's view.

Conclusions

The woodlot licensee met the Code's logging and road building requirements related to managing water resources, with the exception that it channelled a small creek without authority to do so. That stream work is not expected to significantly affect water quality or quantity flowing to the ecological reserve. MOF adequately enforced the Code with regard to the unauthorized stream work.

The Board was unable to assess whether complying with Code requirements, which were not specifically crafted to deal with special features such as the ecological reserve, was adequate to protect water flowing into the ecological reserve.

The statutory decision maker was responsible for considering forest resources not explicitly addressed by legislation, but did not provide an analysis of risk or a transparent rationale demonstrating how he concluded that the 1997 forest development plan would adequately manage and conserve forest resources. More caution, deliberation and transparency were warranted, given the importance of the reserve and the uncertainty about the impact of the

proposed development. Under the circumstances, the statutory decision maker's approval of the plan was not reasonable.

The district manager's rationale for approving the 2003 amendment was incomplete, but included a documented analysis of risk that considered advice from a hydrologist. On balance, it was reasonable for the district manager to decide that the amendment would adequately manage and conserve forest resources and to approve it.

Commentary

The Code provided "tools" that allowed government to increase certainty that special resource features would be addressed. It allowed government to establish an objective for a sensitive area as a higher level plan, requiring operational plans to be consistent with that objective. The Code also allowed government to require specific management practices in the area of the ecological reserve, by establishing general wildlife measures for identified wildlife species (which includes plants). In addition to those Code tools, government can provide non-binding guidance to forest practitioners through strategic land-use documents such as a land and resource management plan (LRMP).

In this case, the Okanagan Shushwap LRMP establishes protected areas near the reserve, but does not provide any management guidance for nearby areas that are available for development. Government has not established general wildlife measures or higher level plan objectives for the Crown forest land near the meadows. The result is that management and conservation of water flowing into the ecological reserve had to rely entirely on the statutory decision makers' review and approval of the forest development plan and amendment.

Under the *Forest and Range Practices Act* (FRPA), the option to establish higher level plan objectives and general wildlife measures remains, but the safety net provided by the district manager's consideration of whether the plan adequately manages and conserves forest resources before approval is gone. Accountability for the results of practices is shifted to industry and its professionals. A licensee can specify management results and strategies in a forest stewardship plan or woodlot license plan that, once approved, become the licensee's obligation. However, a licensee is not required to propose such strategies or results if it chooses to follow FRPA's default requirements, which do not address unique features such as the ecological reserve except through general riparian requirements. A plan approver cannot require a licensee to include additional results and strategies as a condition of approval.

In this case, the licensee and MOF staff, including the MOF hydrologist, have recently proposed forest practices intended to minimize any potential effects on water flowing to the meadows. The licensee recently committed to implementing most of those practices in a letter to the district manager. For example, the licensee has stated that in the future it will locate roads to minimize surface width and cut-slope height, and use reserve zones on all streams. The Board encourages such initiatives that support forest practitioners by clearly setting out management

expectations, and suggests that the licensee incorporate its commitment into future woodlot licence plans.

For this complex management issue that involves a sensitive natural resource, the Board believes that government should also support forest practitioners by taking a coordinated landscape-level approach that considers water quality and quantity for the entire watershed of the meadows. A landscape-level approach should consider the outstanding recommendations made by the hydrologists in 1996 and 2003, including undertaking further study to improve understanding of the wetland, surface hydrology, groundwater, geochemistry and climatic processes, and determining the optimum water levels in the meadows. It would need to consider and involve all parties using the watershed, including private land owners, forest companies, recreation groups and other tenure holders.

Recommendations

1. The Board recommends that the Ministry of Sustainable Resource Management (MSRM) develop plans or objectives, enforceable under FRPA, that ensure that changes to the landscape manage for potential impacts to the Mara Meadows ecological reserve. In accordance with section 132 of FRPA, the Board requests that MSRM report to the Board by August 1, 2004 on how it plans to implement the recommendation, and report by April 1, 2005 on the progress it has made.

2. The Board recommends that the Ministry of Forests (MOF) build on recent work done with the woodlot licensee operating in the Mara Meadows watershed to ensure that all licensees operating in the watershed adopt forest and range practices that adequately manage and conserve the Mara Meadows ecological reserve while management plans or objectives are being developed. In accordance with section 132 of FRPA, the Board requests that MOF report to the Board by August 1, 2004 on progress it has made to implement this recommendation.

3. Further information is needed to assess the impact of forestry operations on the Mara Meadows watershed, and to provide feedback for plans or objectives to be developed by MSRM. The Board recommends that the Ministry of Water, Land and Air Protection (MWLAP) collect baseline data on the Mara Meadows ecological reserve, including the ecosystem processes sustaining it. In accordance with section 132 of FRPA, the Board requests that MWLAP report to the Board by August 1, 2004 on how it plans to implement the recommendation, and report by April 1, 2005 on the progress it has made.